What is claimed is:

1. A method in a wireless network node of coordinating a transit link between network nodes in a wireless communication network, comprising:

monitoring a plurality of transit links between the network node and a respective plurality of neighbouring network nodes for a communications control signal from any of the plurality of neighbouring network nodes;

receiving the communications control signal from one of the plurality of neighbouring network nodes;

selecting one of the plurality of transit links between the network node and the one of the plurality of neighbouring network nodes; and

exchanging data between the network node and the one of the plurality of neighbouring network nodes via the one of the plurality of transit links.

2. The method of claim 1, further comprising:

reverting to monitoring the plurality of transit links upon completion of the exchanging.

3. The method of claim 1, wherein monitoring comprises operating the network node in a neighbourhood mode to listen for the communications control signal from any of the plurality of neighbouring network modes, and exchanging comprises operating the network node in a traffic mode.

4. The method of claim 3, wherein operating the network node in a neighbourhood mode comprises operating a first antenna at the network node, and wherein operating the network node in a traffic mode comprises operating a second antenna at the network node.

5. The method of claim 3, wherein operating the network node in a neighbourhood mode comprises operating a plurality of antenna elements of an antenna system at the network node, and wherein operating the network node in a traffic mode comprises operating one of the plurality of antenna elements in the antenna system at the network node.

6. The method of claim 1, wherein the communications control signal is a "request-to-send" packet.

7. The method of claim 6, wherein the data comprises a "clear-to-send" packet.

8. The method of claim 3, further comprising:

transitioning to the traffic mode when the network node has data to send.

9. The method of claim 1, further comprising:

performing access traffic functionality to send data to and to receive data from wireless terminals.

10. The method of claim 3, further comprising:

performing access traffic functionality to send data to and to receive data from wireless terminals; and

transitioning to the traffic mode when the network node has data, received from a neighbouring network node or a wireless terminal, to send to another network node.

11. The method of claim 3, further comprising:

transitioning to the traffic mode when a neighbourhood mode timeout expires.

12. The method of claim 1, further comprising:

setting a rendezvous time between the network node and the one of the plurality of neighbouring network nodes upon completion of the exchanging.

13. The method of claim 12, wherein setting a rendezvous time comprises:

assigning the network node as one of a master network node and a slave network node for the one of the plurality of transit links;

where the network node is the master network node:

calculating the rendezvous time; and

sending the rendezvous time to the one of the plurality of neighbouring network nodes; and

where the network node is the slave network node:

receiving the rendezvous time from the one of the plurality of neighbouring network nodes.

14. The method of claim 13, wherein calculating the rendezvous time comprises calculating the rendezvous time based on expected data traffic over the transit link.

15. The method of claim 13, wherein calculating the rendezvous time comprises calculating the rendezvous time based on observed data traffic over the transit link.

16. The method of claim 13, wherein calculating the rendezvous time comprises calculating the rendezvous time based on negotiation between the network node and the one of the plurality of neighbouring network nodes.

17. The method of claim 12, wherein setting the rendezvous time comprises setting a default rendezvous time as the rendezvous time.

18. The method of claim 12, further comprising:

setting rendezvous transit link parameters upon completion of the exchanging.

19. The method of claim 13, further comprising, where the network node is the master network node:

reverting to monitoring the plurality of transit links upon completion of sending the rendezvous time; and

sending a rendezvous signal to the one of the plurality of neighbouring network nodes via the one of the plurality of transit links at the rendezvous time.

20. The method of claim 19, further comprising, where the network node is the slave network node:

receiving the rendezvous signal from the one of the plurality of neighbouring network nodes; and

sending a rendezvous response signal to the one of the plurality of neighbouring network nodes via the one of the plurality of transit links.

21. The method of claim 20, further comprising:

exchanging data via the transit link in response to the rendezvous response signal.

22. The method of claim 19, further comprising, where the network node is the master network node:

determining whether the network node has data traffic to send to the one of the plurality of neighbouring network nodes; and

including in the rendezvous signal an indication of whether the master network node has data traffic to send to the one of the plurality of neighbouring network nodes.

23. The method of claim 20, further comprising, where the network node is the slave network node:

determining whether the network node has data traffic to send to the one of the plurality of neighbouring network nodes; and

including in the rendezvous response signal an indication of whether the network node has data traffic to send to the one of the plurality of neighbouring network nodes.

24. The method of claim 22, wherein the rendezvous signal comprises a "request-to-send" (RTS) packet where the network node has data traffic to send, and wherein the rendezvous signal comprises a "clear-to-send" (CTS) packet where the network node has no data traffic to send.

25. The method of claim 24, further comprising, where the network node is the slave network node:

receiving the rendezvous signal from the one of the plurality of neighbouring network nodes;

sending a CTS packet to the one of the plurality of neighbouring network nodes where the rendezvous signal comprises an RTS packet; and

sending data traffic to the one of the plurality of neighbouring network nodes where the rendezvous signal comprises a CTS packet.

26. The method of claim 19, further comprising:

receiving the communications control signal from the one of the plurality of neighbouring network nodes after setting the rendezvous time;

selecting the one of the plurality of transit links;

exchanging data over the one of the plurality of transit links; and

re-calculating a new rendezvous time.

27. The method of claim 1, wherein the monitoring is performed for at least one of the plurality of transit links at a respective predetermined rendezvous time.

28. A network node for an asynchronous communication network, comprising:

a transit link antenna system;

a transit radio connected to the transit link antenna system and configured to communicate with neighbouring network nodes over transit links using the transit link antenna system; and

a communications controller configured to operate the network node in a plurality of operating modes, comprising a

neighbourhood mode to listen for communications control signals from any of the neighbouring network nodes, and a traffic mode to select one of the transit links and to exchange data with one of the neighbouring network nodes over the one of the transit links in response to a communications control signal from the one of the neighbouring network nodes.

29. The network node of claim 28, wherein the communications controller is further configured to operate the network node in the traffic mode when the network node has data to send to any of the neighbouring network nodes.

30. The network node of claim 28, wherein the transit link antenna system comprises a neighbourhood mode antenna and a traffic mode antenna, each having a respective defined beam pattern.

31. The network node of claim 30, wherein the transit link antenna system further comprises:

a feeding port;

an antenna selection switch connected to the feeding port, the neighbourhood mode antenna, and the traffic mode antenna, and configured to switch excitation signals between the feeding port and either the neighbourhood mode antenna or the traffic mode antenna responsive to a control signal from the communications controller.

32. The network node of claim 31, wherein the neighbourhood mode antenna comprises an omni-directional antenna, wherein the traffic mode antenna comprises an array antenna having a plurality of directional antenna elements, and wherein each of the transit links is associated with one of the plurality of directional antenna elements.

33. The network node of claim 32, wherein the transit link antenna system further comprises:

an antenna beam selection switch connected to the antenna selection switch and to each of the plurality of directional antenna elements and configured to switch excitation signals between the antenna selection switch and the one of the plurality of directional antenna elements associated with the one of the transit links responsive to a beam selection signal from the communications controller.

34. The network node of claim 28, wherein the transit link antenna system comprises an array antenna having a plurality of directional antenna elements, each of the transit links being associated with one of the plurality of directional antenna elements, and wherein the communications controller operates more than one of the plurality of directional antenna elements in the neighbourhood mode and selects one of the plurality of directional antenna elements in the traffic mode.

35. The network node of claim 28, wherein the transit link antenna system comprises an array antenna having a plurality of directional antenna elements, each of the transit links

being associated with phase shifts applied to excitation signals of the directional antenna elements to steer a peak in a gain pattern of the array antenna toward a respective one of the neighbouring network nodes in the traffic mode.

36. The network node of claim 28, wherein the plurality of modes further comprises a rendezvous mode to exchange data with the neighbouring network nodes at respective predetermined rendezvous times.

37. The network node of claim 36, wherein the rendezvous time and rendezvous transit link parameters for each neighbouring node are set after completion of a data exchange between the network node and the neighbouring node.

38. The network node of claim 37, wherein the communications controller switches the network node from the traffic mode to the neighbourhood mode upon completion of a data exchange.

39. The network node of claim 38, wherein the communications controller switches the network node from neighbourhood mode to rendezvous mode at the rendezvous time

40. A communication network comprising a plurality of network nodes as claimed in claim 28.

41. A system for coordinating a transit link between network nodes in an asynchronous communication network, comprising:

means for monitoring a plurality of transit links between a network node and a respective plurality of neighbouring network nodes for a communications control signal from any of the plurality of neighbouring network nodes;

means for receiving the communications control signal from one of the plurality of neighbouring network nodes;

means for selecting the one of the plurality of transit links between the network node and the one of the plurality of neighbouring network nodes; and

means for exchanging data between the network node and the one of the plurality of neighbouring network nodes via the one of the plurality of transit links.

42. The system of claim 41, further comprising:

means for establishing contact between the network node and the plurality of neighbouring network nodes at respective scheduled contact times.

43. The system of claim 41, wherein the means for selecting selects the one of the plurality of transit links based on an identification of the one of the plurality of neighbouring network nodes in the communications control signal and a lookup table mapping the plurality of transit links to the plurality of neighbouring network nodes.

44. In a network node of a wireless communication network, a method of coordinating a transit link between the network node and a neighbouring network node in the wireless communication network, comprising:

assigning the network node as either a master network node or a slave network node for the transit link;

where the network node is the master network node:

scheduling a rendezvous time for the transit link;

transmitting the rendezvous time to the slave network node for the transit link; and

transmitting a rendezvous signal to the slave network node at the rendezvous time; and

where the network node is the slave network node:

receiving the rendezvous time from the master network node for the transit link;

listening to receive the rendezvous signal at the rendezvous time; and

transmitting a rendezvous response signal to the master network node upon receiving the rendezvous signal.

45. The method of claim 44, wherein the network node has a plurality of neighbouring network nodes in the wireless communication network.

46. The method of claim 45, wherein the method is repeated for each transit link between the network node and the plurality of neighbouring network nodes.

47. The method of claim 44, wherein the rendezvous signal includes an indication of whether the master network node has data traffic to send to the slave network node, and wherein the rendezvous response signal includes an indication of whether the slave network node has data traffic to send to the master network node, further comprising:

exchanging data traffic over the transit link where the master network node has data traffic to send to the slave network node or where the slave network node has data traffic to send to the master network node.

48. The method of claim 47, wherein the method is repeated upon completion of the exchanging.

49. A wireless network comprising a plurality of wireless network nodes, each wireless network node comprising:

a respective access radio and omni-directional access antenna providing communications services to mobile terminals;

a respective transit radio and transit antenna system providing communications with other wireless network nodes, the transit antenna system having a plurality of antenna segments each producing a respective beam such that a 360 degree coverage is provided;

a respective communications controller controlling communications between pairs of mobile terminals through the access radio and the access antenna system, controlling communications between a mobile station and another wireless network node through the access radio, the access antenna system, the transit radio, and a segment of the transit antenna system, and controlling communications from a first other wireless network node to a second other wireless network node through the transit radio and pairs of the segments of the transit antenna system.

50. The wireless network of claim 49, wherein each wireless network node further comprises an auxiliary antenna port and an antenna detector adapted to automatically detect whether or not an auxiliary antenna is coupled to the auxiliary antenna port, wherein the auxiliary antenna, when detected, is treated by the communications controller as a transit antenna segment, and wherein the auxiliary antenna has a greater gain than the transit antenna system segments.